

for earlier years include also the production of the 328 native undertakings, but in any case their quota is comparatively small. In 1913 Caucasias furnished 31 per cent. of the total Russian output. All Caucasian copper is disposed of in Russia.

Unexploited copper exists in the Naltchinsky Hills 135 and over a small area on each side of the Ossetian Military Road; in both cases the deposits are estimated to be rich.

The production of *Glauber's salt* in Tiflis in 1910, 317 amounting to 725 metric tons, represented nearly half of Russia's total output.

Iron is worked only spasmodically. It occurs chiefly 327 in the Government of Elisavetopol, at Chinarlidz, where the veins are from 2 to 21 metres thick, and as haematite at Sirimadan in the Pambak Mountains and in the Boyan valley. Nearly 2,000 metric tons were produced in 1908, but in no subsequent year does anything approaching that amount appear to have been obtained. [135]

Lead.—There are extensive deposits of argentiferous 328 lead, but they have been little worked. The largest 135 production is that of the Alagir Smelting Co. in Terek; but the metal also occurs in the Lialvar district, in the upper valley of the Kura, and near Kedabek, and shortly before the war was found near Akmetovskoi station in Kuban.

Manganese.—The principal deposit covers an area 317 of nearly 100 square miles in the Kvirili valley in the Government of Kutais, the head-quarters of the industry being at Chiaturi. The ore contains on an average 40 per cent. manganese, 0.16 per cent. phosphorus, and 8 per cent. silicon, but in some workings the proportion of manganese is as high as 50 per cent. The ore is got out by means of hand picks, and is sorted by hand in a primitive way. It is soft and readily mined, and the firmness of the rock renders extensive timbering unnecessary. The miners do not fully exhaust the drifts, but work on them until they become dangerous or, on account of diminishing yield, unremunerative, a point which is soon reached owing [135]

317to unscientific methods of removal. Much ore is consequently wasted. Since 1909 an increasing amount of ore has been washed for the preparation of ferromanganese, and this has resulted in the serious pollution of the River Kvirili, which runs through the mining district. Regulations have been made to control the practice of discharging refuse into the river, and plans formed to collect the refuse-laden water in an artificial basin, where it could be purified and utilized for generating electric power to be employed in the ferro-manganese furnaces. Little improvement, however, had been effected by 1914.

[47] Many small native firms are occupied in manganese-mining. A little before the war foreign capitalists were acquiring manganese-bearing land, which is usually leased in small lots of from half an acre to 50 acres in extent; about 1910 there was an extensive acquisition of unworked land by German firms. The recent tendency has been for the control of the industry to pass from small to large concerns.

There was a heavy slump in manganese just before 1908, but since that year the output has greatly increased: in 1910 it amounted to 548,300 metric tons; in 1911 it fell again to 451,600 metric tons, but in 1912 it rose to the high figure of 913,500 metric tons, and in [439] 1913 to 1,051,500 metric tons. Nearly the whole output is exported; export figures are given on pp. 83 and 84. The trade was very heavily hit by the war.

Chiaturi competes with India and Brazil for pride of place as supplier of manganese to the world. It has, however, been handicapped by difficulties of transport, though favoured to some extent in the matter of freight rates. The Sharopan-Sachkeri railway lies some distance from the mines, and the ore [492] has to be conveyed in carts or on pack animals to the station, whence further carriage to Poti or Batum is both slow and expensive. The Association of Manganese Producers (see p. 79) had up to 1914 failed to secure from the State anything beyond promises of improvement.

Other places in Caucasla at which manganese occurs³¹⁷ are Kvartala in Batum, where the French Manganese^[471] Ore Co. had arranged for the erection of plant at the end of 1913, Seifalu in Elisavetopol, and in the neighbourhood of Samtredi and Novo-Senaki.

Huge beds of *marl* are now being exploited near Novorossiisk by the cement companies there.

Salt.—There are rock-salt deposits in Erivan and Kars, and a certain amount of evaporated salt is produced in Baku and Daghestan. The total output of salt in 1910 was 28,340 metric tons, which consisted of 16,600 tons of rock-salt from Erivan, 6,930 tons of rock-salt from Kars, 4,370 tons of evaporated salt from Baku, and 440 tons of evaporated salt from Daghestan. The total output in 1911 amounted to 37,830 metric tons, and in 1913 to 32,260 metric tons.

Zinc is worked by the Alagir Smelting Co. at Sadon³²⁸ and Alagir, and from blende ore near Vladikavkaz. The company's works, which are 60 miles from the mines, are fitted with modern plant. In 1914 the company were planning a new exploitation, on a large scale, of both lead and zinc. The output of zinc in 1910 was 3,400 metric tons, and in 1912 the combined production of zinc and argentiferous lead was 26,000 metric tons.

Other Minerals.—At Soglik, near Dash Kessan, in³⁵ the Gokcha range (Erivan) there is an inexhaustible³¹⁶ supply of *alunite*, containing 37.58 per cent. of alum, but it is very little worked. *Antimony* is mined in small quantities in Tiflis. There is *arsenic* ore at Bechenakh, but up to the present it has not been exploited. There is a small output of *asbestos* from Sharopan, Vzhinevi, and Lechgum in Kutais. There are excellent *bitumen* beds on the Black Sea coast, and *asphalt* is a by-product of the petroleum industry. *Cobalt* is mined in small quantities in Elisavetopol. White *diatomite* (infusorial earth), containing 87 per cent. of silica, is worked at Kissatip, near Akhaltsikh (Tiflis). *Emery* is found at Karabulakh (Elisavetopol). *Gold* exists in very small quantities in the alluvial deposits of the Alindja river, and in the ore of the

392 agricultural machinery. The Rossel'mash at Rostov is the largest agricultural machinery plant in the USSR. Baku, Groznyy, Tuapse, Tbilisi, produce machinery used in oil-drilling and in the oil industry, Kutaisi produced machinery for coal mining, Stavropol' for lumbering. [393] Krasnodar has a telephone plant, the area around Pyatigorsk several radio plants. Tbilisi uses machinery used in the textile industry, whereas the machines produced at Taganrog are important in the chemical industry. Taganrog also produces machinery used in the food industry. Batumi and Tbilisi produce machinery used in the tea industry. There are plants like the Dvigatel'stoy at Makahchkala that produce various kinds of machinery.

399 Transportation machinery: Aircraft is
398 produced at Taganrog, Rostov, and Makhachka-
397 la. There is a large automobile plant at Kutaisi, and an auto-assembly plant at Rostov. Novocherkassk produces locomotives (steam), and Novorossiysk bicycles.

396 Shipyards: There are important shipyards at Rostov and Taganrog on the Sea of Azov, at Tuapse on the Black Sea, and at Astrakhan' on the Caspian.

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317 Pumice, gypsum, tuff, and bentonite mines: Pumice is quarried chiefly in Armenia at Anipemza and Akhuryan. Gypsum occurs around the Baskunchak salt mines (Astrakhan' Oblast), whereas tuff, used especially in the building industry, is quarried at Artik (Armenia). Bentonite, a fire-proof clay used in foundry work, in the oil industry, etc., is mined at

● 317 Gumbra in the vicinity of Kutaisi.

Marl mines, cement mills: The greatest marl deposits are around Novorossiysk.

[339] These deposits form the basis of the Novorossiysk cement industry, the principal in the USSR. The cement mills are located both in Novorossiysk proper, and around the city in its various suburbs. There are important cement mills at Ararat (Armenia), at Kaspi (Georgia), at Prokhladnyy (Kabardian ASSR), and at Rostov.

[323] Silicate and kaolin quarries, glass and porcelain works: The glass-works at Dagestanskii Ogni is the really important one. Porcelain works occur in the North and in the South Caucasus.

Obsidian mines; centers of jeweller's trade: Obsidian, a volcanic glass used especially in the jeweller's trade, occurs in Armenia at Tumanyan. The jewelry center of the Caucasus is Kubachi (in the vicinity of Derbent).

[306] Pyrite mines: Quarried especially at Kedabek and Chiragidzor (West Azerbaijan). It is used in the manufacture of sulfuric acid.

Barite mines: This common mineral quarried or mined at Chovdar (Azerbaijan) and at Kutaisi is one of the basic materials for the paint industry.

38 Chemical industry centers: The most important center is Armenia, where chemical plants have been created at Alaverdi (superphosphate), Amamlu (carbide), Leninakan, Kirovakan, and Yerevan. The Baku area is another important chemical industry center. In addition to these, there are important

288 industry is concentrated in the North Caucasus, chiefly at Astrakhan'.

Textile and clothing mills: The most important textile mills are at Baku (Azerbaijan), Leninakan(Armenia), Kutaisi (Georgia), Derbent (Dagestan), Budennovsk (Stavropol' Kray).

295 Clothing mills are concentrated in Georgia (Tbilisi, Batumi), in Armenia (Leninakan), and in the capitals of the Cherkess, Kabardian, and North Ossetian republics.

286 Rug-weaving centers: Rug-weaving is one of the traditional industries of the eastern South Caucasus. Originally it was a home industry of nomadic (mostly Turkic) peoples. The Caucasian rug-weaving industry produces three kinds of rugs: The Daghestani Rug, made in Dagestan and North Azerbaijan; the Shirvan Rug, made in East Azerbaijan; and the Karabagh Rug, made in Armenia and West Azerbaijan.

295 Alunite mines; leather, boot and shoe
282 factories: The most important leather factories are at Baku, Nakhichevan', Tbilisi, Kutaisi, Groznyy, and Stavropol'. Tbilisi, Cherkessk, Rostov, and Taganrog have boot and shoe factories. Alunite, the raw material important for tanning, is mined at Zaglik in Azerbaijan.

313 Lumbering, sawmilling, woodworking
322 plants: Concentrated in Georgia, in the most heavily forested area of the Caucasus. The other areas of concentration are Northern Armenia, and a whole series of cities, towns, and villages, located along the northern slopes of the Greater Caucasus. Important lumbering centers are also Astrakhan' and Rostov, processing imported lumber.

- 322 Furniture plants: Concentrated mostly in Novorossiysk, Maykop, Cherkessk, Rostov, and Kamensk-Shakhtinskiy.
- 289 Paper mills: There are only two important paper mills in the Caucasus. The large one is at Zugdidi in West Georgia, and the smaller one is at Rostov.
- 317 Salt mines: The Caucasus is very rich in salt. This mineral is mined both in the North and in the South Caucasus. The mine around Nakhichevan', and the salt fields of the Apsheron Peninsula supply Trans-caucasia. The salt mines of Baskunchak (Astrakhan' Oblast), representing 1/4 of the total salt production of the USSR, serve all Russia.
- 256 Food industry: This industry is represented everywhere in the Caucasus.
- Flour-milling centers: These are located mostly in the Krasnodar and Stavropol' Krays, and in Rostov Oblast.
- Centers of starch and molasses industry: The center of this industry is the North Ossetian ASSR with its huge Beslan corn kombinat.
- 258 Oil presses: Concentrated especially in the western parts of the North Caucasus (Krasnodar and Stavropol' Krays and Rostov Oblast).
- 257 Sugar refineries: The chief sugar refineries are in Armenia (Amamlu, Leninakan), in Georgia (Agara), and in the Krasnodar Kray (Tikhoretsk, Korenovskaya).
- 255 Fruit-canning centers: Concentrated mostly in the eastern section of the North Caucasus. Dagestan especially is an important fruit-canning area. Other noteworthy fruit-

b. 21 Pumice Mines

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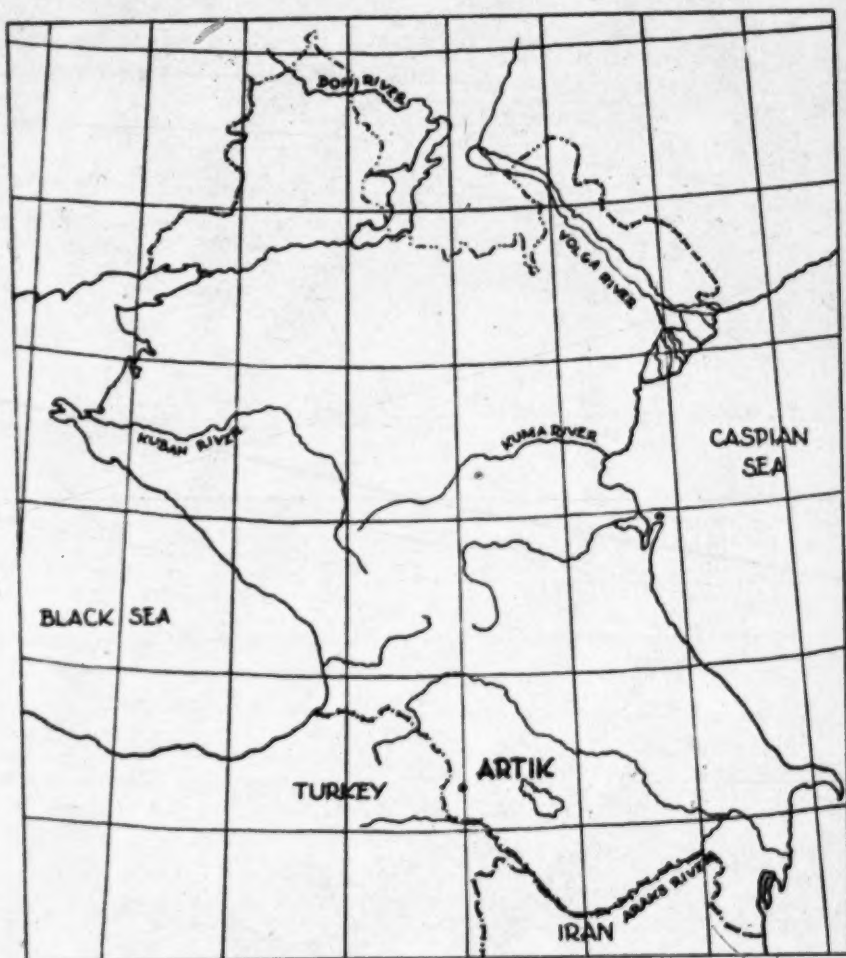
b. 22 Gypsum Mines

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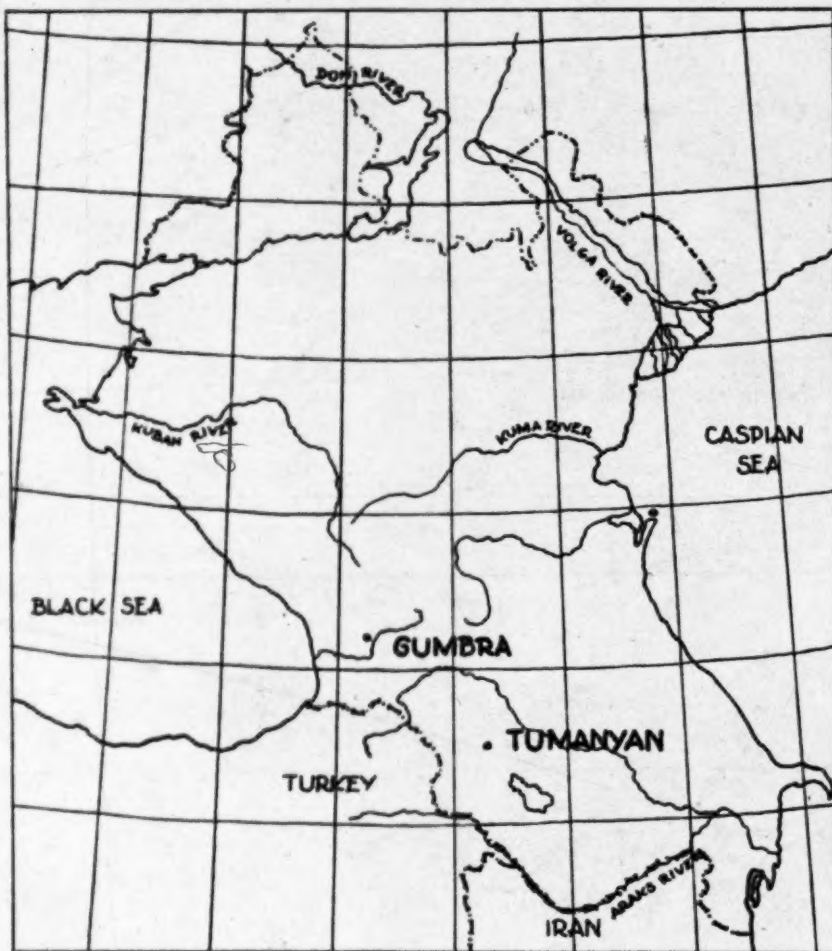
b. 23 Tuff Mines

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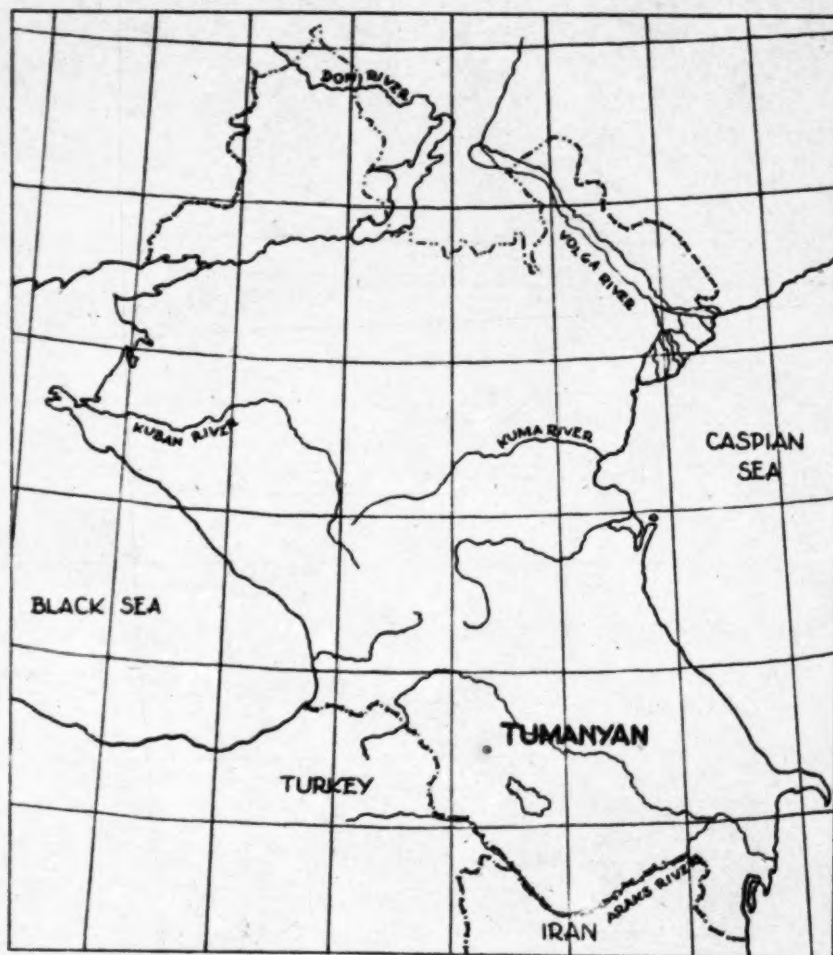
b. 24 Bentonite Mines

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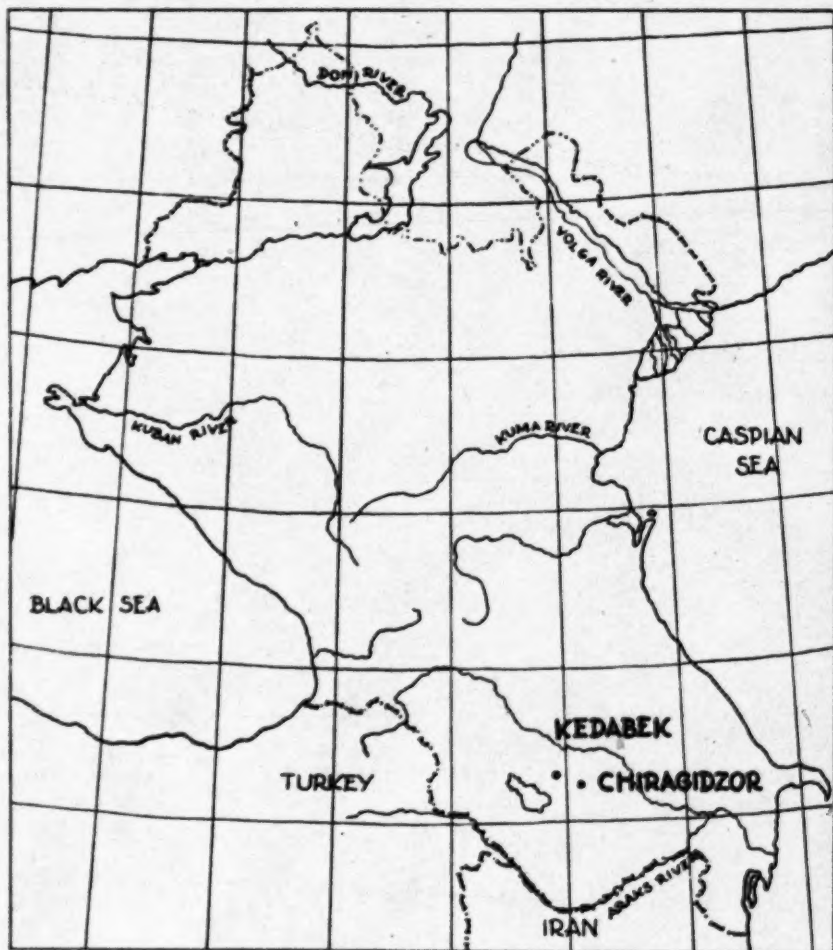
b. 28 Obsidian Mines

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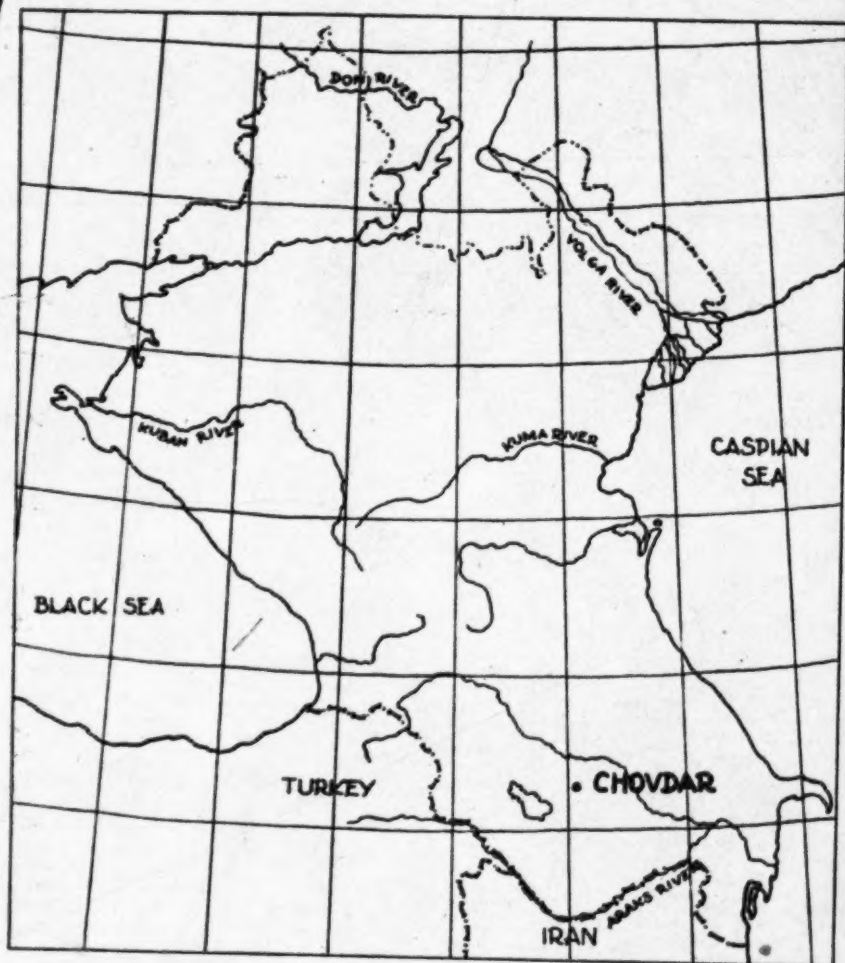
b. 29 Pyrite Mines

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b. 30 Barite Mines

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b. 42 Alunite Mines

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b. 48 Salt Mines

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